

AMENDMENTS TO THE CLAIMS

1-21. (Cancelled)

22. (Currently Amended) A component mounting head for sucking and holding a component so as to place the component at a component mounting position on a board and for releasing the suction and holding of the component to mount the component onto the component mounting position, the component mounting head comprising: ~~The component mounting head as defined in claim 21, further including~~

a suction nozzle including a suction-and-holding face for sucking and holding the component; and

an auxiliary suction member which is formed from an elastic material, the auxiliary suction member having an inner circumferential end portion and an outer circumferential end portion,

wherein a suction hole is defined in the suction-and-holding face, the suction hole having a main hole portion and five extended hole portions,

wherein the main hole portion is formed in a circular shape or a generally circular shape and is concentric with an axial center of the suction nozzle,

wherein the five extended hole portions extend from the main hole portion in five radial directions, respectively, at a generally uniform angular pitch,

wherein the five extended hole portions are integrally formed with the main hole portion such that the suction hole constitutes a single hole formed collectively by the main hole portion and the five extended hole portions,

wherein the inner circumferential end portion of the auxiliary suction member is placed in close contact with an outer circumferential portion of the suction nozzle,

wherein the outer circumferential end portion of the auxiliary suction member projects outwardly from a circumferential portion of the suction-and-holding face,

wherein the outer circumferential end portion of said auxiliary suction member is placed at a position generally equal in height to the suction-and-holding face or slightly backward of the suction-and-holding face,

wherein the suction nozzle includes an auxiliary suction member fitting portion which is set at an outer circumferential portion thereof such that the inner circumferential end portion of the auxiliary suction member is attached thereto and detachable therefrom,

wherein the auxiliary suction member is selectively attached to the auxiliary suction member fitting portion depending on size of the component to be sucked and held,

wherein a fixing member is provided for loading the auxiliary suction member to the auxiliary suction member fitting portion by releasably fixing a contact position of the inner circumferential end portion of the auxiliary suction member against the auxiliary suction member fitting portion, and

wherein a height position of the outer circumferential end portion of the auxiliary suction member is adjustable by adjusting the contact position in a direction parallel to a longitudinal axis of the suction nozzle, the contact position being fixed by the fixing member. position, the

~~contact position being to be fixed by the fixing member, in a direction extending along the axial center of the suction nozzle.~~

23-24. (Cancelled)

25. (New) A component mounting head for sucking and holding a component so as to place the component at a component mounting position on a board and for releasing the suction and holding of the component to mount the component onto the component mounting position, the component mounting head comprising:

a suction nozzle including a suction-and-holding face for sucking and holding the component,

wherein a suction hole is defined in the suction-and-holding face, the suction hole having a main hole portion and five extended hole portions,

wherein the main hole portion is formed in a circular shape or a generally circular shape and is concentric with an axial center of the suction nozzle,

wherein the five extended hole portions extend from the main hole portion in five radial directions, respectively, at a generally uniform angular pitch, and

wherein the five extended hole portions are integrally formed with the main hole portion such that the suction hole constitutes a single hole formed collectively by the main hole portion and the five extended hole portions.

26. (New) The component mounting head as defined in claim 25, wherein the suction nozzle is operable to suck and hold at a component extraction position components fed from a component feed cassette, the component feed cassette accommodating a plurality of the components and feeding out the accommodated components along a component feed direction such that the components are positioned at the component extraction position, and

wherein the suction nozzle is arranged such that the component feed direction of the component feed cassette is coincident with an extending direction of one of the extended hole portions.

27. (New) The component mounting head as defined in claim 26, wherein the main hole portion has a diameter d , a diameter of an outer circumferential end portion of the suction-and-holding face is approximately $3d$, a width of each of the extended hole portions is approximately $0.4d$, and a distance from an axial center of the main hole portion to a distal end of each extended hole portion is approximately $2d$.

28. (New) The component mounting head as defined in claim 25, wherein the suction nozzle comprises:

a projecting member having a tip end portion, the projecting member being disposed within the main hole portion for sliding between a projective position in which the tip end portion is projected from the suction-and-holding face and an accommodated position in which the tip end portion of the projecting member is positioned more inwardly toward the suction-and-holding face than in the projective position; and

a biasing member for biasing the projecting member toward the projective position.

29. (New) The component mounting head as defined in claim 28, wherein the tip end portion of the projecting member is formed of a semiconductor ceramic.

30. (New) The component mounting head as defined in claim 27, wherein the suction-and-holding face of the suction nozzle is surface finished so as to have a multiplicity of depressed/projected portions having heights or depths of about 10 to 20 μm .

31. (New) The component mounting head as defined in claim 30, wherein the multiplicity of depressed/projected portions are recess portions which are formed in the suction-and-holding face so as to make the suction hole and an outer circumferential end portion of the suction-and-holding face communicated with each other.

32. (New) The component mounting head as defined in claim 25, further including an auxiliary suction member which is formed from an elastic material, the auxiliary suction member having an inner circumferential end portion and an outer circumferential end portion,

wherein the inner circumferential end portion of the auxiliary suction member is placed in close contact with an outer circumferential portion of the suction nozzle,

wherein the outer circumferential end portion of the auxiliary suction member projects outwardly from a circumferential portion of the suction-and-holding face, and

wherein the outer circumferential end portion of said auxiliary suction member is placed at a position generally equal in height to the suction-and-holding face or slightly backward of the suction-and-holding face.

33. (New) The component mounting head as defined in claim 32, wherein the suction nozzle includes an auxiliary suction member fitting portion which is set at an outer circumferential portion thereof such that the inner circumferential end portion of the auxiliary suction member is attached thereto and detachable therefrom, and

wherein the auxiliary suction member is selectively attached to the auxiliary suction member fitting portion depending on size of the component to be sucked and held.

34. (New) A component mounting head for sucking and holding a component so as to place the component at a component mounting position on a board and for releasing the suction and holding of the component to mount the component onto the component mounting position, the component mounting head comprising:

a suction nozzle including a suction-and-holding face for sucking and holding the component,

wherein a suction hole is defined in the suction-and-holding face for sucking up the component, the suction hole having a main hole portion and a plurality of extended hole portions,

wherein the main hole portion is formed in a circular shape or a generally circular shape,

wherein the plurality of extended hole portions extend from the main hole portion in a plurality of radial directions, respectively, at a generally uniform angular pitch, and

wherein the plurality of extended hole portions are integrally formed with the main hole portion such that the suction hole constitutes a single hole formed collectively by the main hole portion and the plurality of extended hole portions.

35. (New) The component mounting head as defined in claim 34, wherein the suction nozzle is operable to suck and hold at a component extraction position components fed from a component feed cassette, the component feed cassette accommodating a plurality of the components and feeding out the accommodated components along a component feed direction such that the components are positioned at the component extraction position, and

wherein the suction nozzle is arranged such that the component feed direction of the component feed cassette is coincident with an extending direction of one of the extended hole portions.

36. (New) The component mounting head as defined in claim 35, wherein the main hole portion has a diameter d , a diameter of an outer circumferential end portion of the suction-and-holding face is approximately $3d$, a width of each of the extended hole portions is approximately $0.4d$, and a distance from an axial center of the main hole portion to a distal end of each extended hole portion is approximately $2d$.

37. (New) The component mounting head as defined in claim 34, wherein the suction nozzle comprises:

a projecting member having a tip end portion, the projecting member being disposed within the main hole portion for sliding between a projective position in which the tip end portion is projected from the suction-and-holding face and an accommodated position in which the tip end portion of the projecting member is positioned more inwardly toward the suction-and-holding face than in the projective position; and

a biasing member for biasing the projecting member toward the projective position.

38. (New) The component mounting head as defined in claim 37, wherein the tip end portion of the projecting member is formed of a semiconductor ceramic.

39. (New) The component mounting head as defined in claim 36, wherein the suction-and-holding face of the suction nozzle is surface finished so as to have a multiplicity of depressed/projected portions having heights or depths of about 10 to 20 μm .

40. (New) The component mounting head as defined in claim 39, wherein the multiplicity of depressed/projected portions are recess portions which are formed in the suction-and-holding face so as to make the suction hole and an outer circumferential end portion of the suction-and-holding face communicated with each other.

41. (New) The component mounting head as defined in claim 34, further including an auxiliary suction member which is formed from an elastic material, the auxiliary suction member having an inner circumferential end portion and an outer circumferential end portion,

wherein the inner circumferential end portion of the auxiliary suction member is placed in close contact with an outer circumferential portion of the suction nozzle,

wherein the outer circumferential end portion of the auxiliary suction member projects outwardly from a circumferential portion of the suction-and-holding face, and

wherein the outer circumferential end portion of said auxiliary suction member is placed at a position generally equal in height to the suction-and-holding face or slightly backward of the suction-and-holding face.

42. (New) The component mounting head as defined in claim 41, wherein the suction nozzle includes an auxiliary suction member fitting portion which is set at an outer circumferential portion thereof such that the inner circumferential end portion of the auxiliary suction member is attached thereto and detachable therefrom, and

wherein the auxiliary suction member is selectively attached to the auxiliary suction member fitting portion depending on size of the component to be sucked and held.

43. (New) The component mounting head as defined in claim 42, further including:

a fixing member for loading the auxiliary suction member to the auxiliary suction member fitting portion by releasably fixing a contact position of the inner circumferential end portion of the auxiliary suction member against the auxiliary suction member fitting portion,

wherein a height position of the outer circumferential end portion of the auxiliary suction member is adjustable by adjusting the contact position in a direction parallel to a longitudinal axis of the suction nozzle, the contact position being fixed by the fixing member.